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EDITORIAL COMMENT

Carotid Sinus Massage in Patients Who Fall: Will It Define the Role of Pacing?*

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In this era of diagnostic and therapeutic glitz, can a simple, safe, and universally applicable clinical maneuver—carotid sinus massage—favorably affect a clinical outcome in a large number of patients? Possibly.

In this issue of the *Journal*, Kenny et al. (1) have evaluated patients presenting to an emergency room because of an unexplained fall. In a prospective randomized study they assessed the effect of permanent pacing in individuals who had experienced nonaccidental falls and who had a positive cardioinhibitory response (a 3-s pause) to carotid sinus massage. Insertion of a dual-chamber pacemaker with rate-drop programming resulted in a 70% reduction in the number of subsequent falls compared to nonpaced controls and a 50% reduction in syncope. Given the consequences of falls in the elderly as reviewed by the investigators—injuries

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in 10% to 20% of cases and the sixth leading cause of death—and given their frequency—occurring in 30% to 60% of those over age 65—the potential impact of this combination of a universally applicable maneuver and available treatment (at least in the U.S.) may be significant. The investigators never imply that falls are simple, and they emphasize the potential multifaceted etiology, but the study results imply a significant contribution from bradyarrhythmias.

The problem—falls—is so major, the diagnostic procedure so easy, the treatment so readily available and the study so good that it is tempting to proceed with pacemaker insertion. However, there are many soft aspects to this study. Some relate to methodology. Although the study was prospective and randomized, timing of randomization in relation to the index event is not clear, and pacemakers were not inserted until several weeks after the presumed time of randomization. Additionally, management of associated fall-related variables such as gait disturbances or other medical problems is not addressed and not controlled. The definition of falls is reasonable but leaves room for marked variation in interpretation. Carotid massage resulted in a 3-s pause in 15% of those in whom it was performed. Thus, the majority of patients with nonaccidental falls are not likely to benefit from pacing (or at least were not evaluated in this study). Follow-up was from diary entry. Although the diary return rate was excellent, there are limitations with that approach—a particular problem when considering the issue of amnesia related to falls associated with loss of consciousness that is addressed by the investigators. Moreover, the number of patients in the study is too small to assess the impact on incidence of fractures and mortality (a subject addressed in other studies).

The study by Kenny et al. (1) raises many questions—this can be considered a strength. Are there subgroups in this huge population who can more clearly benefit from pacing? The investigators were very restrictive in regards to trial eligibility; 42% of patients were ineligible because of presumed medical explanations or because of poor performance on a mini-mental status exam. Although reasonable for this study, it is possible that they too can be helped with pacing, adding to the intriguing aspects of this work. Would a 2-s pause, rather than the 3-s pause required for this study, have allowed more participants to benefit from pacing? Can other pacing modalities be just as effective? The value of the more complex, more expensive dual-chamber (as compared to single-chamber) pacing is questioned by recent reports from two large prospective trials (2,3). Perhaps a unit less complex than the two-chamber devices used in the Kenny et al. (1) study could achieve the same results. What are the cost implications? Is the simple "cost-less" maneuver of carotid massage only opening the door to expensive treatment or does it significantly decrease the cost of evaluation and treatment of subsequent falls?

Overall, the Kenny et al. (1) investigation is a landmark study. Still, the limitations are too great to comfortably apply this approach to the huge number of elderly patients presenting with falls. It should serve as a strong stimulus to future research on the subject. As research continues, it also offers an opportunity for clinician scientists to work with pacemaker manufacturers in assessing smaller and more simple, less expensive devices that might adequately achieve the same goals in this population.

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